

In re Patent Application of:
CROCE ET AL.
Serial No. 09/839,596
Filing Date: 4/20/01

REMARKS

The Examiner is thanked for the thorough examination of the present application. Independent Claims 5 and 14 have been amended to more clearly define the subject matter thereof over the prior art. Support for the amendments to Claims 5 and 14 may be found on page 5, lines 3-7 of the originally filed specification, and in FIG. 2b of the drawings, for example. No new matter is being added.

In view of the amendments and the supporting arguments presented in detail below, it is submitted that all of the claims are patentable.

I. The Claimed Invention

The present invention is directed to a lateral diffused metal oxide semiconductor (LDMOS) integrated device. As recited in amended independent Claim 5, for example, the LDMOS device includes a semiconductor substrate and a drain region of a first conductivity type adjacent the semiconductor substrate and including a superficial buffer region being more heavily doped than adjacent portions of the drain region. Moreover, the LDMOS device also includes a body region completely surrounded on a bottom and sides thereof by the buffer region and having a second conductivity type, and a source region in the body region and having the first conductivity type. The LDMOS device thus provides a RESURF structure that may be used at relatively high voltages yet with a reduction in punch through problems.

Independent Claim 14 is directed to a related LDMOS integrated device. This claim has similarly been amended to recite that the body region is completely surrounded on a bottom and sides thereof by the buffer region as in Claim 5.

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II. The Claims Are Patentable

The Examiner rejected independent Claims 5 and 14 over Lidow et al. As perhaps best seen in FIG. 2 of Lidow et al., this patent is directed to a high power vertical diffused MOSFET 20 in which two laterally spaced-apart n+ sources 32, 33 are controlled by a single gate. Each of the sources 32, 33 supply current through channel regions 34, 35 in respective p+ diffusion regions 30, 31. The channel regions 34, 35 lead from source electrodes 23, 24 to a relatively low resistivity, epitaxially-formed drain region (n-) which is deposited on a high conductivity substrate 20a. Immediately adjacent and beneath the gate and in the path from the sources 32, 33 to the drain is a relatively high conductivity n+ region 40, which reduces the on-resistance of the device. Further, the breakdown voltage of the device is increased by making the p+ diffusions 30, 31 relatively deep and with a large radius of curvature beneath each of the sources 32, 33.

The Examiner contends that the region 40 and the n+ region 86 in the alternate embodiment illustrated in FIG. 8 of Lidow et al. (which is similar to the region 40) are superficial buffer regions as recited in independent Claims 5 and 14. Moreover, the Examiner also contends that the n+ region 86 surrounds a p+ "body" region 91, as also recited in these claims.

Claims 5 and 14 have now been amended to recite that the body region is completely surrounded on a bottom and sides thereof by the superficial buffer region. In stark contrast, the n+ region 86 does not completely surround the p+ region 91 on sides and a bottom thereof, as is clearly illustrated in FIG. 8 of Lidow et al. The remaining prior art of record similarly fails to teach or suggest this noted deficiency.

Accordingly, it is submitted that independent Claims 5 and 14 are patentable over the prior art. Their respective

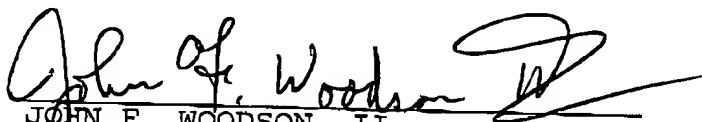
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dependent claims, which recite yet further distinguishing features, are also patentable over the prior art and require no further discussion herein.

CONCLUSIONS

In view of the amendments to the claims and the arguments presented above, it is submitted that all of the claims are patentable. Accordingly, a Notice of Allowance is respectfully requested in due course. Should any minor informalities need to be addressed, the Examiner is encouraged to contact the undersigned attorney at the telephone number listed below.

Respectfully submitted,



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